



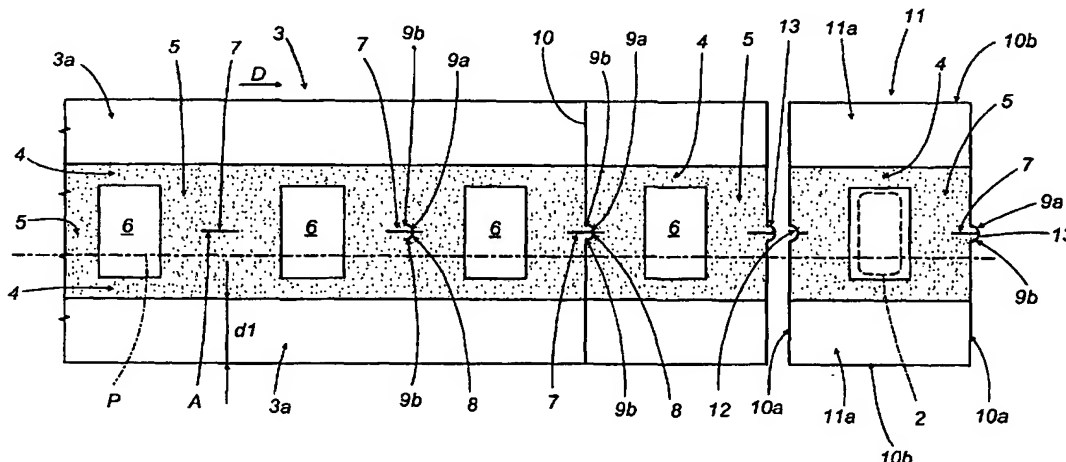
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A METHOD OF MAKING PRODUCT WRAPS, A LEAF FROM WHICH TO FASHION A WRAP OBTAINABLE BY THE METHOD, AND A STRIP FROM WHICH TO OBTAIN THE LEAF



(S7) Abstract: Confectionery products (2) are packaged singly indouble twist wraps (1) prepared from a strip(3) coated with first longitudinal bands (4) and second transverse bands (5) of adhesive, the transverse bands spaced apart to create adhesive-free zones (6) offered in direct contact to the products (2), and caused to advance along a set path (P) in a given feed direction (D). The strip is prepared with an easy tear point (A) on each second adhesive band (5), consisting of a first notch (7) extending parallel to the longitudinal axis of the strip (3) and a second notch (8) superimposed on the first notch (7); the strip (3) is then cut transversely along the second bands (5) to generate single leaves (11), each presenting an indentation (12) and a projection (13) generated by the second notch (8). The leaf (11) is folded around the product (2) to produce a hermetically sealed wrap (1) designed to tear open from the notches.

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Description

A method of making product wraps, a leaf from which
to fashion a wrap obtainable by the method, and a
strip from which to obtain the leaf

Technical Field

The present invention relates to a method of making product wraps, also to a leaf used in fashioning a wrap obtainable by the method, and to a strip of material from which single leaves are obtained.

Background Art

5 In particular, the invention finds application to advantage in the art field of packaging, and more specifically of fashioning individual wraps around confectionery products such as chocolates and sweets and the like.

10 The prior art embraces packaging methods whereby wraps of the familiar double twist type are fashioned from leaves of wrapping material, each presenting a substantially rectangular outline. The single leaves are cut transversely from a continuous strip of the
15 selected material.

The product is placed at the centre of the leaf, and the leaf then bent around the product to bring the longitudinal edges together, thus forming a tube, whereupon the two ends of the tube are twisted to
20 produce the characteristic wrap with two wings.

To open a wrap of this kind, the consumer seizes and pulls the two ends, causing the wings to unravel and free the contents.

5 The prior art also includes wraps of which the longitudinal edges and the twisted ends are coated with adhesive material, serving to seal the contents more effectively.

10 More exactly, and as disclosed in PCT publication WO 97/24273, these wraps are obtained by applying two continuous bands of adhesive material to the edges of the continuous strip, extending longitudinally along its entire length. In addition, the strip presents a plurality of bands of the adhesive material extending transversely to the longitudinal dimension and spaced
15 apart one from the next. The strip is cut along each transverse band of adhesive material to generate a plurality of single leaves, each presenting bands of adhesive material around its peripheral outline.

20 The product is then wrapped by joining together the bands of adhesive along the longitudinal edges and twisting the ends in such a way as to pinch the transverse bands of adhesive. Thus, the adhesive bands provide a tighter seal and a firmer closure of the product internally of the wrap.

25 A wrap of this type betrays the notable drawback of being difficult to open in order to consume the product. Formerly, without adhesive, the wrap could be opened by pulling the twisted ends in opposite directions, but with the wings pinched and stuck,
30 they can no longer unravel freely as before.

To overcome this drawback, the joined longitudinal edges of double twist wrapper leaves can be provided with a notch (see EP 816229, for example) serving to facilitate the step of opening the wrap. Pulling from the edges on either side of the notch, the wrap is torn along a line generated by the selfsame notch.

The notch is produced in the assembled wrap by a special device (generally a wheel) that carries each of the single wraps into a position of interaction with a cutter, whereupon the cutter makes an incision in the joined longitudinal edges.

This solution also presents a significant drawback, however, attributable to the excessive bulk of the notching device.

To make a single notch, in effect, the longitudinal edges must be cut when already joined together, and this can be done only by conveying each single wrap into contact with the cutter after it has been closed around the product. Generally speaking, the notching device consists in a wheel carrying a plurality of grippers by which the assembled wraps are taken up and advanced toward the cutter. The wheel takes up considerable space and the process of fashioning the single wraps is made complex and laborious precisely by reason of the need to carry each one toward the notching cutter. Consequently, the cost of producing the single wrap is increased.

Moreover, in the event that the longitudinal edges are not joined neatly together, the cutter can enter into contact with the product and tear parts of the

wrap intended specifically to keep the product enclosed.

5 The object of the present invention is to overcome the drawbacks indicated above by adopting a method of making wraps for small items, a leaf from which to fashion the wrap obtainable by such a method, and a relative strip of wrapping material, all as described and illustrated in the present disclosure.

10 In particular, it is an object of the invention to provide a method of making product wraps that will be easy to implement and can be performed without the need for complex and bulky wrapping devices.

15 A further object of the invention is to fashion an easily openable sealed wrap procured initially as a leaf of wrapping material cut from a continuous strip and requiring no additional preparation.

Disclosure of the Invention

20 The stated object is realized according to the present invention in a method of making product wraps comprising the steps of: causing a continuous strip of wrapping material, presenting at least two bands of adhesive extending parallel with its longitudinal dimension, to advance along a predetermined path; cutting the strip transversely along dividing lines to obtain a plurality of leaves each presenting longitudinal edges coinciding with relative dividing lines; associating at least one product with a respective substantially central area of each leaf; 25 folding each leaf around a relative product and

bringing together the two longitudinal edges to form a tubular sheath; closing the ends of the tubular sheath to obtain a wrap, characterized in that it comprises a step, preceding the step of folding each
5 leaf around a relative product, of establishing at least one point between the two adhesive bands and coinciding with the transverse dividing line, from which to initiate an easy tear along a direction substantially transverse to the longitudinal edges of
10 the leaf.

The stated object is realized likewise, according to the present invention, by providing a strip of material from which to fashion product wraps, of the type comprising: a pair of first adhesive bands
15 extending parallel to the longitudinal edges of the strip; also a predetermined number of second adhesive bands extending transversely to the longitudinal dimension of the strip and spaced apart one from the next, wherein the first and second adhesive bands
20 define a plurality of product placement zones each compassed between one second band and the next, characterized in that it comprises at least one notch located to coincide with each second adhesive band.

Lastly, the stated object is realized in a leaf of
25 wrapping material according to the present invention from which to fashion a product wrap, as obtainable in particular by the method according to any one of the appended claims, comprising: a top face presenting a substantially rectangular peripheral
30 outline; a pair of first adhesive bands extending

along the mutually opposed and parallel shorter sides of the peripheral outline presented by the top face; a pair of second adhesive bands extending along the mutually opposed and parallel longer sides of the peripheral outline presented by the top face; a placement zone delimited by the pairs of first and second bands in which to position at least one product; and a first notch located along each second adhesive band and extending parallel to the first adhesive bands, characterized in that it further comprises at least one second notch establishing an indentation located on a respective second adhesive band and presenting the first notch.

The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

-figure 1 is the plan view of a strip of wrapping material illustrated in a first embodiment according to the present invention;

-figure 1a is the plan view of a strip of wrapping material illustrated in a variation on the first embodiment shown in figure 1;

-figure 2 is the plan view of a strip of wrapping material illustrated in a second embodiment;

-figure 3 is the plan view of a strip of wrapping material illustrated in a third embodiment;

-figure 4 is the perspective view of a product wrap obtained from the strip of figure 3;

-figure 5 is the plan view of a strip of wrapping material illustrated in a fourth embodiment;

-figure 6 is the perspective view of a product wrap obtained from the strip of figure 5;

-figure 7 is the perspective view of a product wrap obtained from the strip of figure 5 and containing, in particular, an item of confectionery.

With reference to the drawings, 1 denotes a wrap, in its entirety, for products 2 of small dimensions, particularly items of confectionery such as toffees, chocolates and the like.

Referring in particular to figure 1, the wrap 1 is obtained from a strip 3 of wrapping material caused to advance by means of conventional embodiment (not illustrated) along a predetermined path P and in a predetermined direction D.

The strip 3 presents two first adhesive bands 4, extending parallel with the longitudinal dimension of the strip 3 in positions on either side of its longitudinal axis. More exactly, the first bands 4 in question are located near to the two longitudinal edges 3a of the strip 3, and separated from the selfsame edges 3a by a predetermined distance d1 for reasons that will become clear in due course.

The first bands 4 extend continuously along the entire developable length of the strip 3 and will consist of any given material applicable in liquid or solid form and able to produce an adhesive surface, such as one of the cold glues widely used in the packaging sector.

The strip 3 also presents a predetermined number of second adhesive bands 5 extending transversely to the

longitudinal dimension of the strip 3.

More particularly, the second adhesive bands 5 are spaced apart so as to establish a placement zone 6 between one band 5 and the next, in which to position the product 2. In practice, each placement zone 6 interposed between two successive second bands 5 will present a substantially rectangular outline of which the longer sides coincide with the selfsame second bands 5 and the shorter sides coincide with the first adhesive bands 4, thereby creating an adhesive-free zone 6 offered in contact to the product 2.

Each of the second adhesive bands 5 will coincide also with an easy tear point A, at which at least one first notch 7 is made.

The strip 3 is cut crosswise along successive transverse dividing lines 10, each coinciding with a second adhesive band 5 and with the relative easy tear point A, to generate a plurality of leaves 11.

In the example of figure 1, the notch 7 extends along a middle portion of the dividing line 10 and consists in a segment 7a of broken line appearance, in this instance presenting a zigzag profile.

In the example of figure 1a, the segment 7a extends along the full length of the dividing line 10.

In the second embodiment illustrated in figure 2, the first notch 7 is substantially rectilinear and extends parallel to the longitudinal dimension of the strip 3. The notch 7 is produced by a suitably shaped cutter, conventional in embodiment and therefore not described or illustrated further. If the notch were

to be produced with the strip advancing continuously, for example, the cutter could be carried by the peripheral surface of a roller interacting with a reaction roller positioned on the opposite side of the path P from the cutter roller; in this instance
5 the cutter or cutters will be timed or spaced on the revolving surface so as to strike at a predetermined frequency corresponding to the distance separating two successive notches 7 presented by the strip 3.

10 With reference to figures 3 and 4, which illustrate the third embodiment disclosed, this also presents a second notch 8 (produced likewise using a cutter able to interact with the strip 3 in the manner described above), by which the first notch 7 is intersected
15 transversely. The second notch 8 illustrated in figure 3 presents a substantially "U" shaped outline and consists in practice of a central, substantially semicircular segment 9a extending transversely across the first notch 7, and two substantially rectilinear
20 segments 9b merged with the respective ends of the central segment 9a.

The second notch 8 could equally well present a "Vee" or a substantially "W" or "S" shape, and will be positioned in any event to coincide with the
25 dividing line 10.

Each leaf 11 obtained by cutting the strip 3 along the dividing lines 10 will present two longitudinal edges 10a generated by the transverse cut. In other words, the dividing lines 10 extend transversely to
30 the strip 3, while establishing the longitudinal

edges 10a of the single leaf 11.

In more detail, each leaf 11 presents a substantially rectangular face 11a offered in direct contact to the relative product 2, the aforementioned placement area 6 being positioned at the centre of this same face 11a. The single leaf 11 thus appears with the second adhesive bands 5 extending parallel to the edges 10a constituting the longer sides of the leaf 11, and the first adhesive bands 4 extending parallel to the remaining edges denoted 10b which coincide with the shorter sides.

In the examples of figures 1 and 3, the transverse cut made across the continuous strip 3, along the dividing line 10, is interrupted at the easy tear point A so as not to interfere with the first and second notches 7 and 8. In practice, therefore, the transverse cut made along the dividing line 10 consists effectively in two distinct cuts, each extending from a respective rectilinear segment 9b to a corresponding longitudinal edge 3a of the strip 3.

In particular, the second notch 8 is cut in such a manner as to create an indentation 12 in one leaf 11 and a projection 13 on the adjacent leaf 11, the shape of the projection 13 matching the shape of the indentation 12.

Thus, each leaf 11 presents an indentation 12 on one of the two second adhesive bands 5, and a projection 13 on the second adhesive band 5 opposite. It will be seen that, in making the transverse cut across the strip 3, the first notch 7 is divided into

two parts, each constituting a respective part of the projection 13 and of the indentation 12.

In the fourth embodiment of the wrap, illustrated in figures 5 and 6, the second notch 8 consists in a hole 14 (pierced by a cutter of circular cross section) superimposed on the first notch 7. In this instance, the transverse cut across the strip 3 can be made along the dividing line 10 in a single stroke, with no need for any break at the easy tear point A.

The leaf 11 thus presents two mutually opposed indentations 12, each coinciding with a respective second adhesive band 5 and each also presenting a first notch 7.

Significantly, the second notch 8 can be cut together with the first notch 7, either before or simultaneously with the step of cutting the strip 3 transversely. In any event, the indentations 12 and projections 13 are made directly in the continuous strip 3, rather than in the assembled wrap 1.

To fashion the wrap 1 illustrated in figure 4, the product 2 is positioned in the placement zone 6 of a corresponding leaf 11 of wrapping material, and the leaf then gathered initially around the product 2 to form a tubular sheath, with the two second adhesive bands 5 joined together. More exactly, the longer sides of the leaf 11 are joined with the respective second adhesive bands 5 offered one to the other along the corresponding edges 10a, with the result that the two bands 5 are stuck together. Observing

figure 4, it will be seen that the positions of the projection 13 and the indentation 12 coincide, albeit the two are marginally offset one from the other. This is how the wrap will appear in reality, as a result of the two edges 10a of the leaf 11 shifting one relative to the other when formed into a tube around the product 2.

Likewise in figure 6, which illustrates the fourth embodiment of the wrap, the two indentations 12 are substantially aligned, yet slightly offset one from another.

Once the tubular sheath has been formed, the two open end portions presenting the two first adhesive bands 4 are twisted to form two wings 15, thereby pinching the leaf along the respective bands 4 and sealing the wrap 1 hermetically.

Referring to figure 7, the wrap 1 containing a relative product 2 is opened simply by pulling on the projection 13 or the indentations 12.

More exactly, and referring to the third embodiment of figure 4, the effect of pulling the projection 13 is that the first notch 7 will initiate a tear to separate the two edges of the projection 13. Once the tear has opened along the full length of the projection 13, along a line denoted 16, it will continue into the first notch 7 presented by the indentation 12. At this point, both the edges of the leaf 11 bearing the second adhesive bands 5 will have been torn through and separated, and the wrap 1 can be opened up with notable ease.

In the case of the fourth embodiment, the method of opening the wrap 1 is the same as described above. In this instance the pulling force will be applied first to one of the two indentations 12, then continued
5 until the tear extends through both of the two first notches 7 afforded by the respective indentations 12.

The present invention affords numerous advantages.

Firstly, the method of manufacturing the single wrap 1 is extremely simple and does not call for the use of cumbersome cutting mechanisms, neither for any
10 special handling and conveying of the wrap 1 after being closed. In effect, the first notch 7 of the easy tear feature is applied directly to the strip 3 before fashioning the wrap.

In addition, there is no need for the second adhesive bands 5 to be joined so that the first notches 7 are perfectly matched, given that with the addition of the second notch 8 establishing the indentation 12, a tear can be made through both edges
15 of the wrap 1 without difficulty.

Furthermore, the effect of forming the notches 7 and 8 directly in the strip 3 is to speed up the operation of assembling the wrap 1, since there is no need for any further processing steps once the wrap
20 has been closed, and no requirement for an especially precise alignment between the first notches 7 on each of the second adhesive bands 5.

Claims

1) A method of making product wraps, comprising the steps of:

- causing a continuous strip (3) of wrapping material, presenting at least two bands (4) of adhesive extending parallel with its longitudinal dimension, to advance along a predetermined path;

- cutting the strip (3) transversely along dividing lines (10) to obtain a plurality of leaves (11) each presenting longitudinal edges (10a) coinciding with relative dividing lines (10);

- associating at least one product (2) with a respective substantially central area of each leaf (11);

- folding each leaf (11) around a relative product (2) and bringing together the two longitudinal edges (10a) to form a tubular sheath;

- closing the ends of the tubular sheath to obtain a wrap (1),

characterized in that it comprises a step, preceding the step of folding each leaf (11) around a relative product (2), of establishing at least one point (A) between the two adhesive bands (4) and coinciding with the transverse dividing line (10), from which to initiate an easy tear along a direction substantially transverse to the longitudinal edges (10a) of the leaf (11).

2) A method as in claim 1, wherein the step of establishing an easy tear point (A) comprises the step of generating at least one notch (7) on each dividing line (10), extending parallel to the longitudinal dimension of the strip (3) and intersecting the relative line (10).

3) A method as in claim 2, comprising the further step of generating a second notch (8) coinciding with the first notch (7) and serving to create an indentation (12) and a projection (13) on the opposite longitudinal edges (10a) presented by each leaf (11).

4) A method as in claim 3, wherein the first notch (7) and the second notch (8) are generated prior to the step of cutting the strip (3) transversely along the dividing lines.

5) A method as in claim 3, wherein the first notch (7) and the second notch (8) are generated simultaneously with the step of cutting the strip (3) transversely along the dividing lines.

6) A method as in claim 3, wherein the steps of generating the first notch (7), generating the second notch (8) and cutting the strip (3) transversely along the dividing lines are implemented in sequence.

7) A method as in claims 3 to 6, wherein the second notch (8) presents an outline substantially of "U" shape, or substantially of "Vee" shape, or substantially of "W" shape, or substantially of "S" shape.

8) A method as in claim 3, wherein the step of generating a second notch (8) comprises the subsidiary step of piercing the easy tear point (A) in such a way as to create two indentations (12) in each leaf (11), each presented by a respective longitudinal edge (10a).

9) A method as in claims 3 to 8, wherein the step of cutting the strip (3) transversely along the dividing line (10) comprises the subsidiary steps of making two distinct cuts along the selfsame line, each extending from the second notch (8) toward a longitudinal edge (3a) of the strip (3).

10) A method as in claim 2, wherein the step of generating at least one first notch (7) parallel to the longitudinal dimension of the strip (3) is implemented before the step of cutting the strip (3) transversely along the dividing line (10).

11) A method as in claim 1, wherein the step of establishing an easy tear point (A) comprises the step of generating at least one segment (7a) of

broken line appearance positioned to coincide with the transverse dividing line (10).

12) A method as in claim 11, wherein the broken line segment (7a) extends the full length of the transverse cut made across the strip (3).

13) A method as in claims 1 to 12, wherein the continuous strip (3) presents second adhesive bands (5) extending transversely to the longitudinal dimension of the strip (3), each coinciding with a relative easy tear point (A).

14) A method as in claims 1 to 13, comprising the step of twisting the ends of the tubular sheath to produce a sealed double twist wrap (1).

15) A method as in claims 1 to 14, comprising the step, implemented as the strip (3) advances along the predetermined direction and before the step of generating the notches, of applying the first and second adhesive bands (4, 5) to the selfsame strip.

16) A strip of material from which to fashion product wraps, of the type comprising:
- a pair of first adhesive bands (4) extending parallel to the longitudinal edges (3a) of the strip (3);

- a predetermined number of second adhesive bands (5) extending transversely to the longitudinal dimension of the strip (3) and spaced apart one from the next, wherein the first and second adhesive bands (4, 5) define a plurality of product (2) placement zones (6) each compassed between one second band (5) and the next, characterized in that it comprises at least one notch (7) located to coincide with each second adhesive band (5).

17) A strip as in claim 16, comprising a second notch (8) positioned to coincide with the at least one first notch (7), wherein the first notch (7) extends parallel with the longitudinal dimension of the strip (3).

18) A strip as in claim 17, wherein the second notch (8) consists in a hole (14) positioned to coincide with the first notch (7).

19) A strip as in claim 17, wherein the second notch (8) presents an outline substantially of "U" shape, or substantially of "Vee" shape, or substantially of "W" shape, or substantially of "S" shape, including a central segment (9a) extending transversely across the first notch (7), and two parallel segments (9b) extending from respective ends of the central segment (9a).

20) A strip as in claim 16, wherein the at least one notch (7) presents at least one segment of broken line appearance extending transversely to the longitudinal dimension of the strip (3).

- 5 21) A leaf of wrapping material from which to fashion a product wrap obtainable by the method according to any one of claims 1 to 15, comprising:
- a top face (11a) presenting a substantially rectangular peripheral outline;
 - 10 - a pair of first adhesive bands (4) extending along the mutually opposed and parallel shorter sides of the peripheral outline presented by the top face (11a);
 - a pair of second adhesive bands (5) extending along
15 the mutually opposed and parallel longer sides of the peripheral outline presented by the top face (11a);
 - a placement zone (6) delimited by the pairs of first and second bands (4, 5), in which to position at least one product (2); and
 - 20 - a first notch (7) located along each second adhesive band (5) and extending parallel to the first adhesive bands (4),
- characterized in that it further comprises at least one second notch (8) establishing an indentation (12)
25 located on a respective second adhesive band (5) and presenting the first notch (7).

22) A leaf as in claim 21, further comprising a projection (13) extending outward from a respective

second adhesive band (5) opposite to the second adhesive band (5) presenting the indentation (12), wherein the first notch (7) is presented by the projection (13).

- 5 23) A leaf as in claim 22, wherein the projection (13) and the indentation (12) are mutually opposed, and the second adhesive bands (5) can be joined together in such a way as to bring the projection (13) into a position of substantial alignment with
10 the indentation (12).

24) A leaf as in claim 10, comprising two mutually opposed indentations (12) each positioned to coincide with a respective second adhesive band (5) and presenting the first notch (7).

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FIG. 1

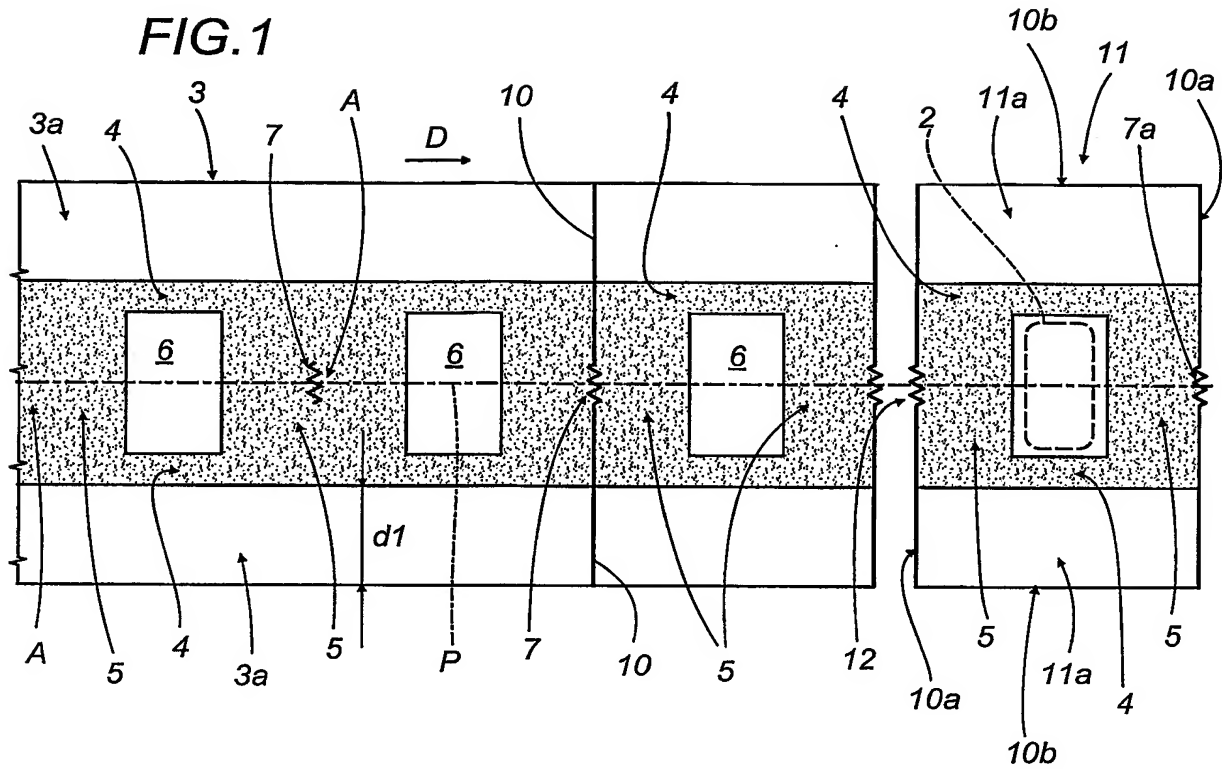
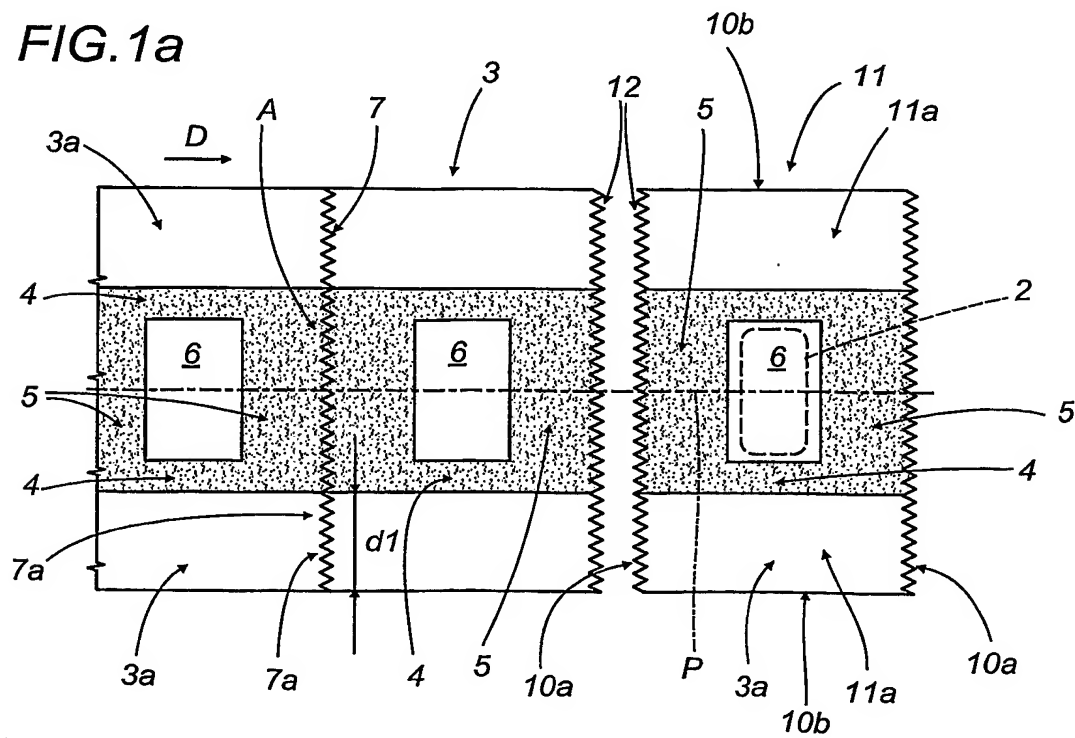


FIG. 1a



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FIG. 2

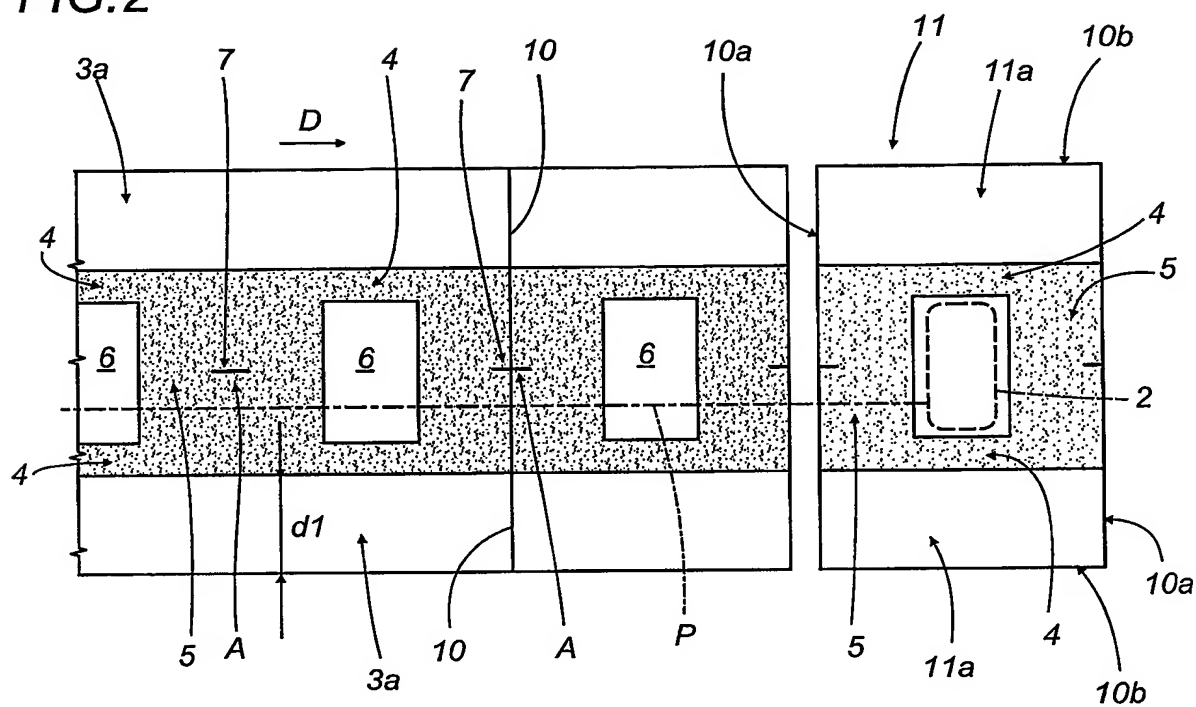
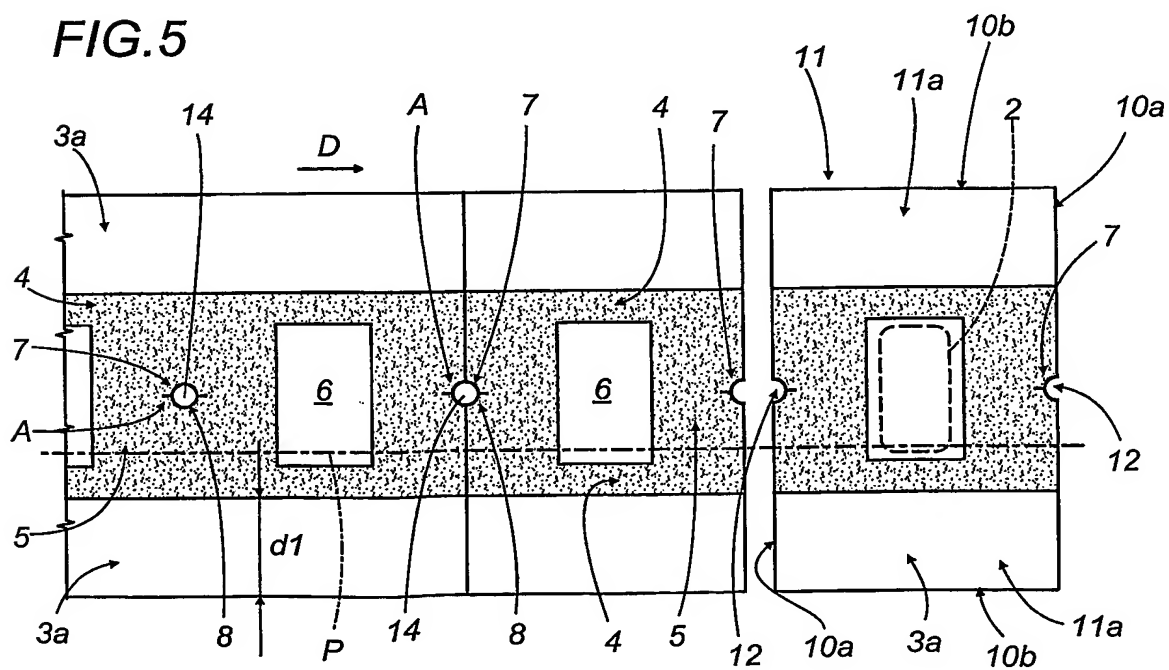
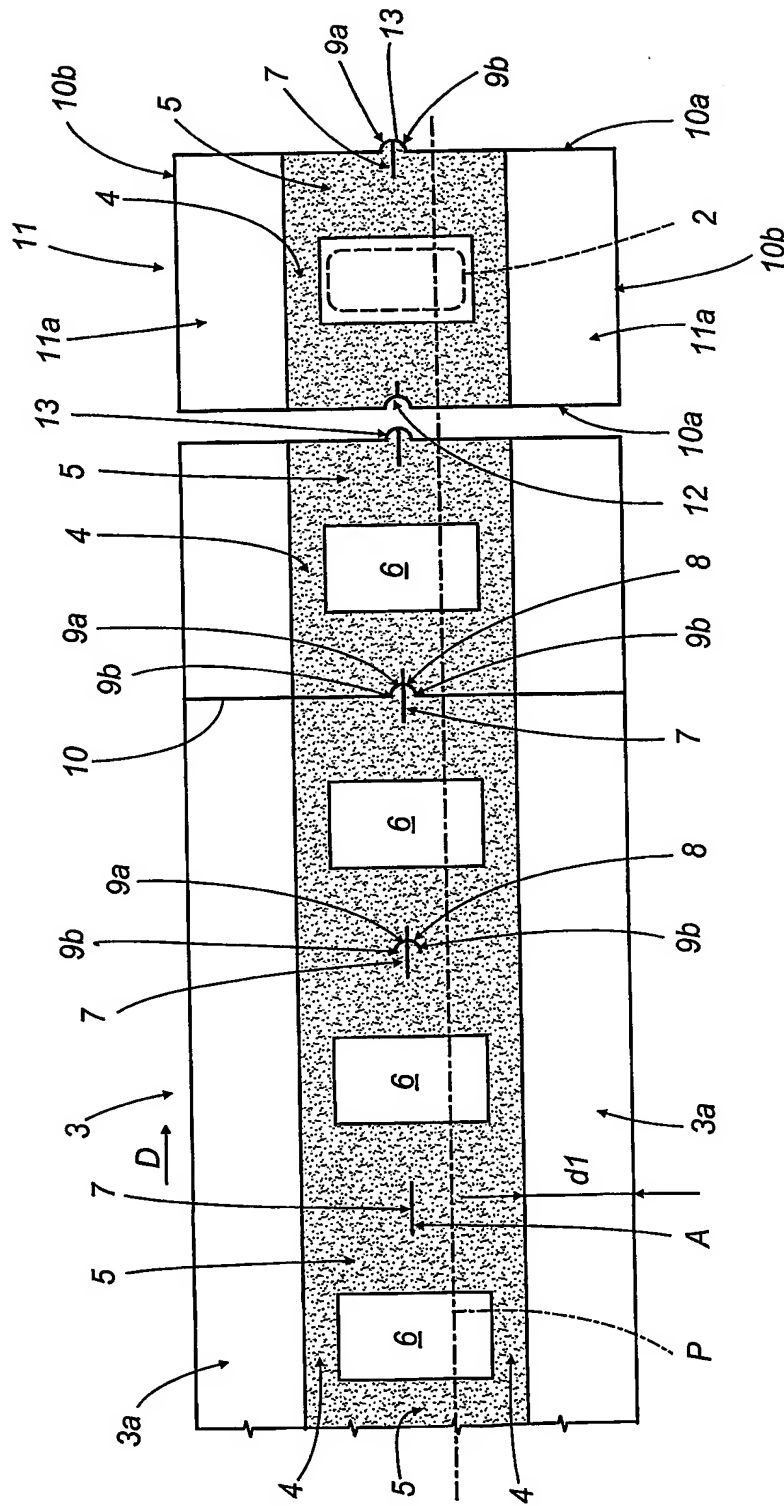


FIG. 5

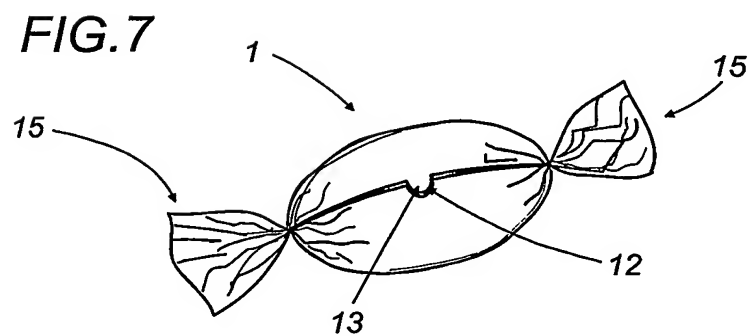
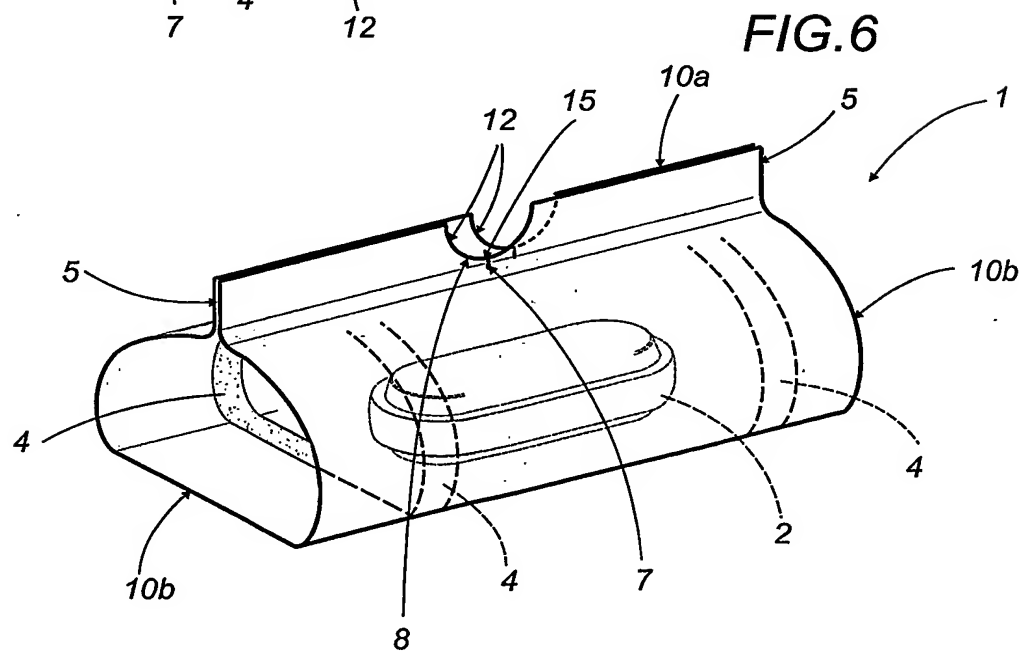
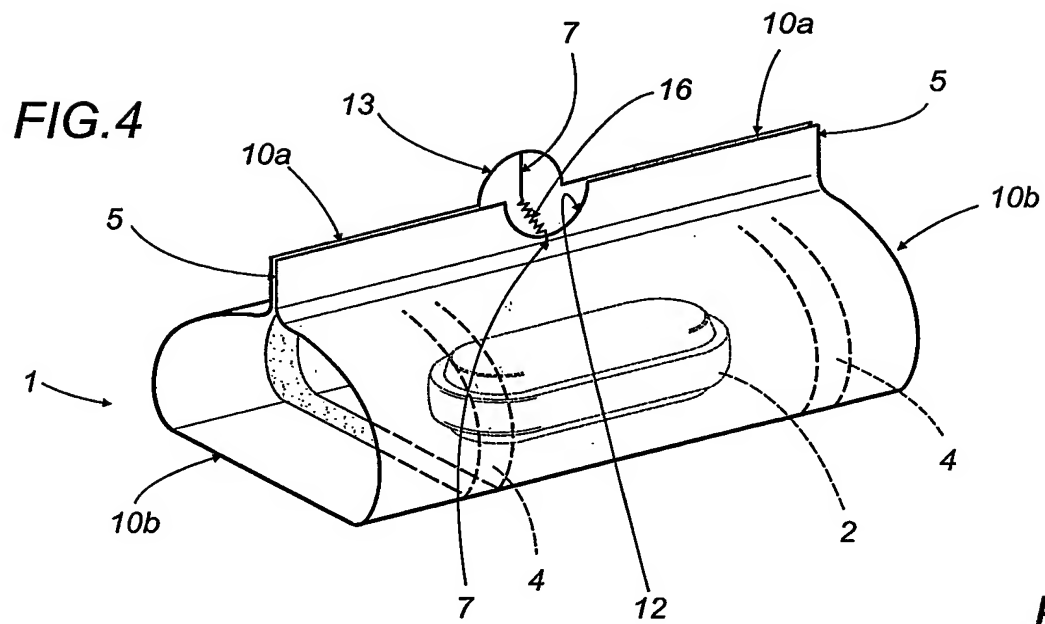


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FIG.3



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INTERNATIONAL SEARCH REPORT

In Application No

PCT/7003/02498

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B65B11/14 B65B61/18 B65D75/10 B65D65/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B65B B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 816 229 A (PACTEC VERPACKUNGSMASCHINEN FA) 7 January 1998 (1998-01-07) cited in the application	21
Y	column 2, line 32 - column 4, line 8 column 6, line 5 - line 13; figures 5,6	22-24
Y	US 4 911 685 A (HUCKS BILLY R) 27 March 1990 (1990-03-27) figures 1-3	22-24
A	US 5 935 686 A (DAELMANS EDDY ET AL) 10 August 1999 (1999-08-10) figures 1-11	1-24
A	GB 666 501 A (MUNISING PAPER COMPANY) 13 February 1952 (1952-02-13) page 3, line 26 - line 55; figure 8	16

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

 Inter: Application No
 PCT/IP/02498

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0816229	A	07-01-1998	DE 19626157 A1 02-01-1998 DE 29623691 U1 04-03-1999 DE 59706827 D1 08-05-2002 EP 0816229 A1 07-01-1998
US 4911685	A	27-03-1990	NONE
US 5935686	A	10-08-1999	BE 1009877 A3 07-10-1997 AT 190287 T 15-03-2000 AU 704044 B2 15-04-1999 AU 7288396 A 28-07-1997 BR 9608171 A 09-02-1999 CA 2227735 A1 10-07-1997 CN 1189137 A ,B 29-07-1998 CZ 289226 B6 12-12-2001 CZ 9800055 A3 16-06-1999 DE 69607044 D1 13-04-2000 DE 69607044 T2 12-10-2000 EE 9700307 A 15-06-1998 WO 9724273 A1 10-07-1997 EP 0929467 A1 21-07-1999 ES 2143234 T3 01-05-2000 GR 3033520 T3 29-09-2000 HK 1017872 A1 08-03-2002 HU 9900140 A2 28-04-1999 JP 2001515436 T 18-09-2001 NO 975926 A 10-02-1998 NZ 320186 A 28-10-1998 PL 323588 A1 14-04-1998 PT 929467 T 30-06-2000 RU 2136560 C1 10-09-1999 SI 929467 T1 31-08-2000 SK 9898 A3 06-05-1998 TR 9701724 T1 21-05-1998 ZA 9610893 A 27-06-1997 DK 929467 T3 31-07-2000
GB 666501	A	13-02-1952	NONE